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FIG. 1

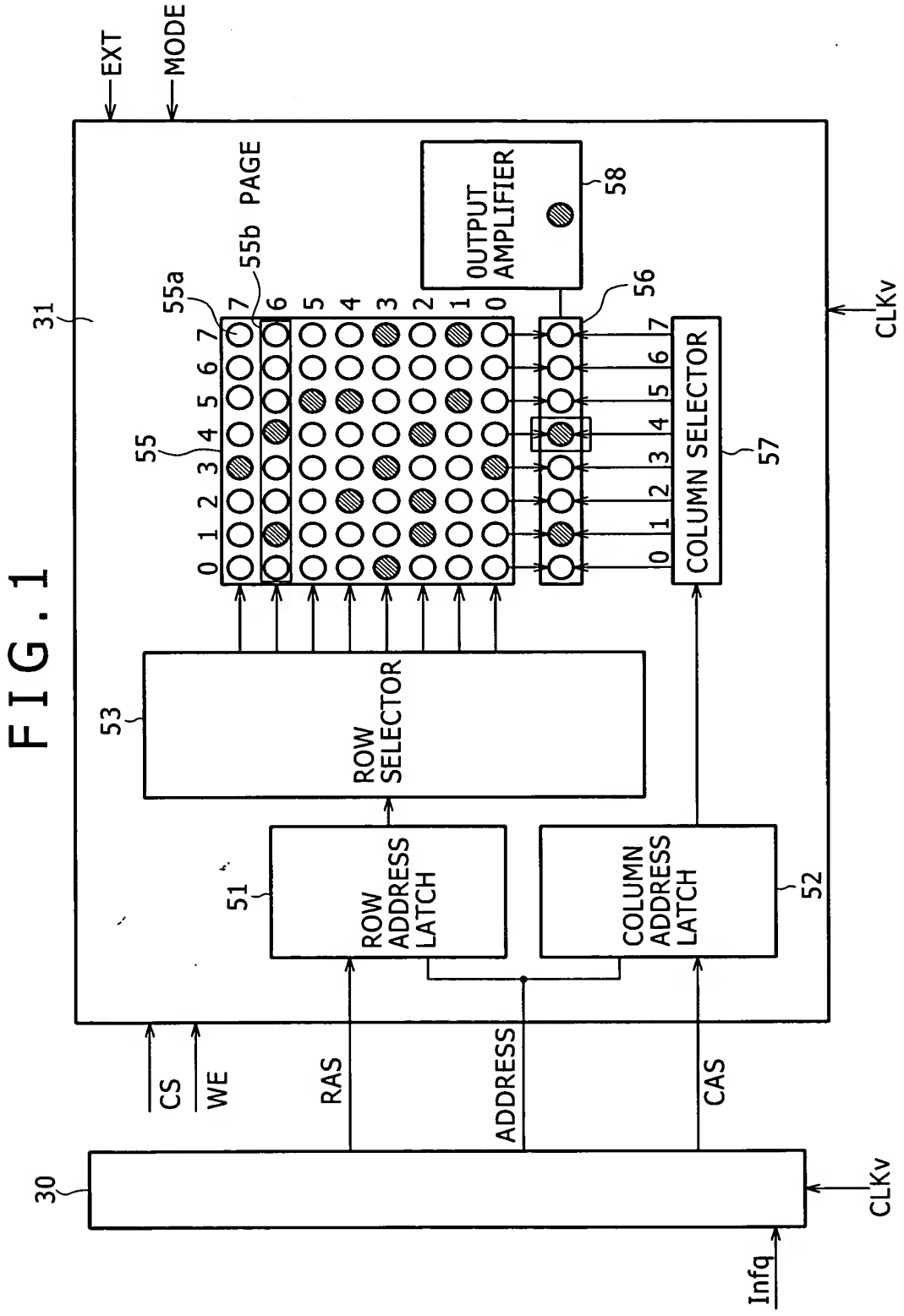

FIG. 2

TYPICAL RELATIONSHIP BETWEEN SIGNALS AND COMMANDS

	COMMAND	OPERATION	CS	RAS	CAS	WE	EXT	MODE	ROW ADDRESS	BANK	COLUMN ADDRESS
	DESL	NO-OPERATION	H	X	X	X	X	X	X	X	X
	NOP	NO-INSTRUCTION	L	H	H	H	H	X	X	X	X
	READ	READ	L	H	L	H	H	X	X	V	V
	WRITE	WRITE	L	H	L	L	H	X	X	V	V
	ACT	ACTIVATE	L	L	H	H	H	X	V	V	X
	PRE	PRECHARGE	L	L	H	L	H	X	V	V	X
	PALL	ALL-BANK PRECHARGE	L	L	H	L	H	X	X	X	X
	REF	REFRESH	L	L	L	H	H	X	X	X	X
	MRS	MODE SET	L	L	L	L	H	X	*	*	*
	BST	BURST STOP	L	H	H	L	H	X	X	X	X
EXTENDED COMPLEX OPERATIONS	P+A+R	PRE+ACT+READ	L	X	X	H	L	L	V	V+	V
	P+A+W	PRE+ACT+WRITE	L	X	X	L	L	L	V	V+	V
	A+R	ACT+READ	L	X	X	H	L	H	V	V+	V
	A+W	ACT+WRITE	L	X	X	L	L	H	V	V+	V

SYMBOL	MEANING
L	0
H	1
X	ARBITRARY
V	VALID (V+MAY REQUIRE TWO TIMES AMOUNT OF INFORMATION.)
*	PARTIALLY VALID

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FIG. 3A

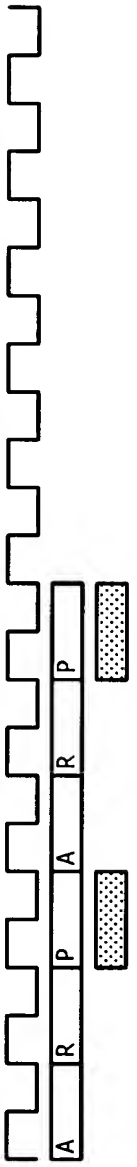

FIG. 3B

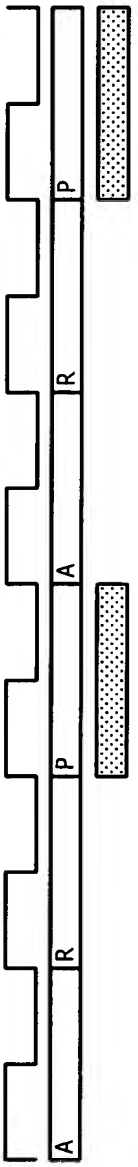

FIG. 3C

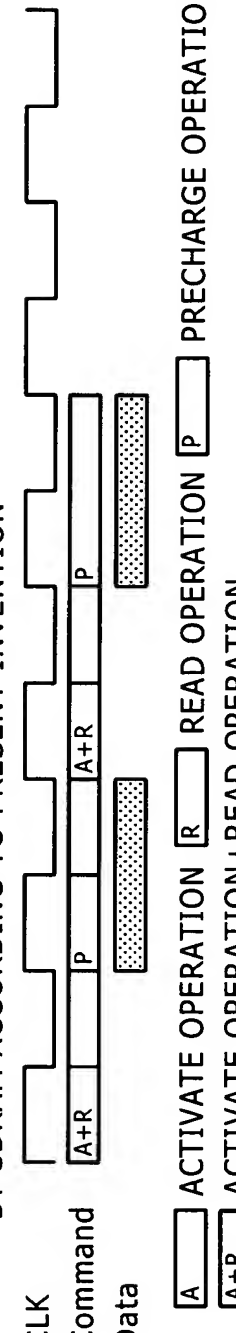

FIG. 4A

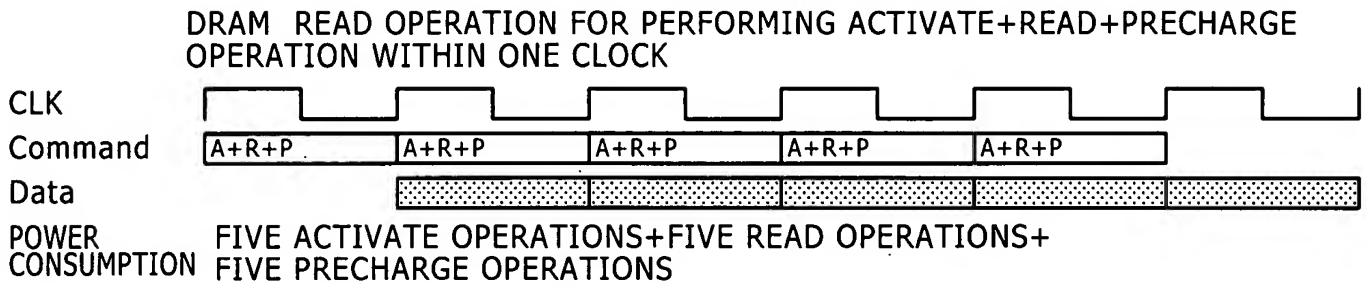

FIG. 4B

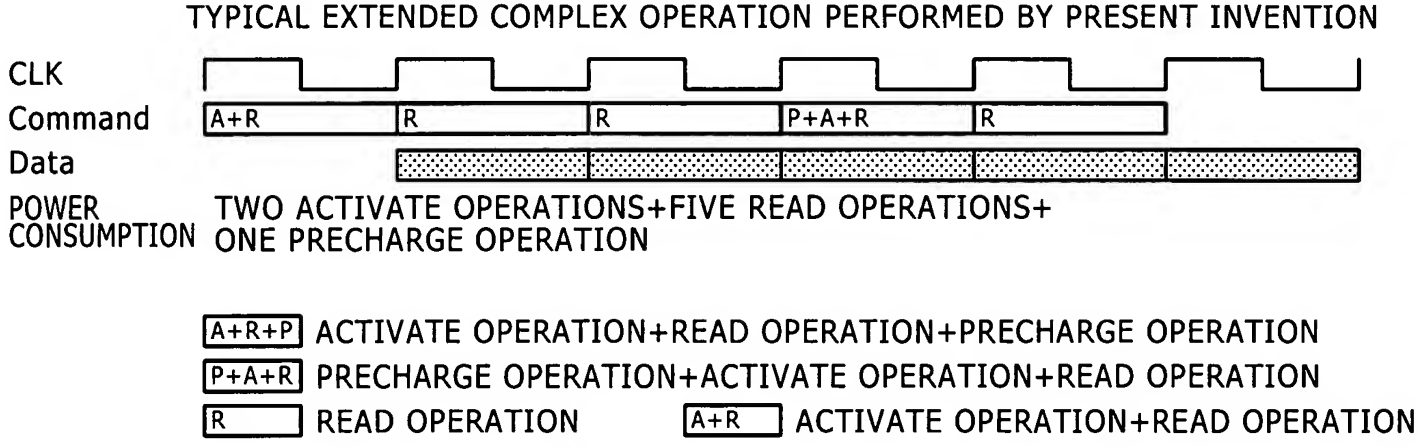

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FIG. 5

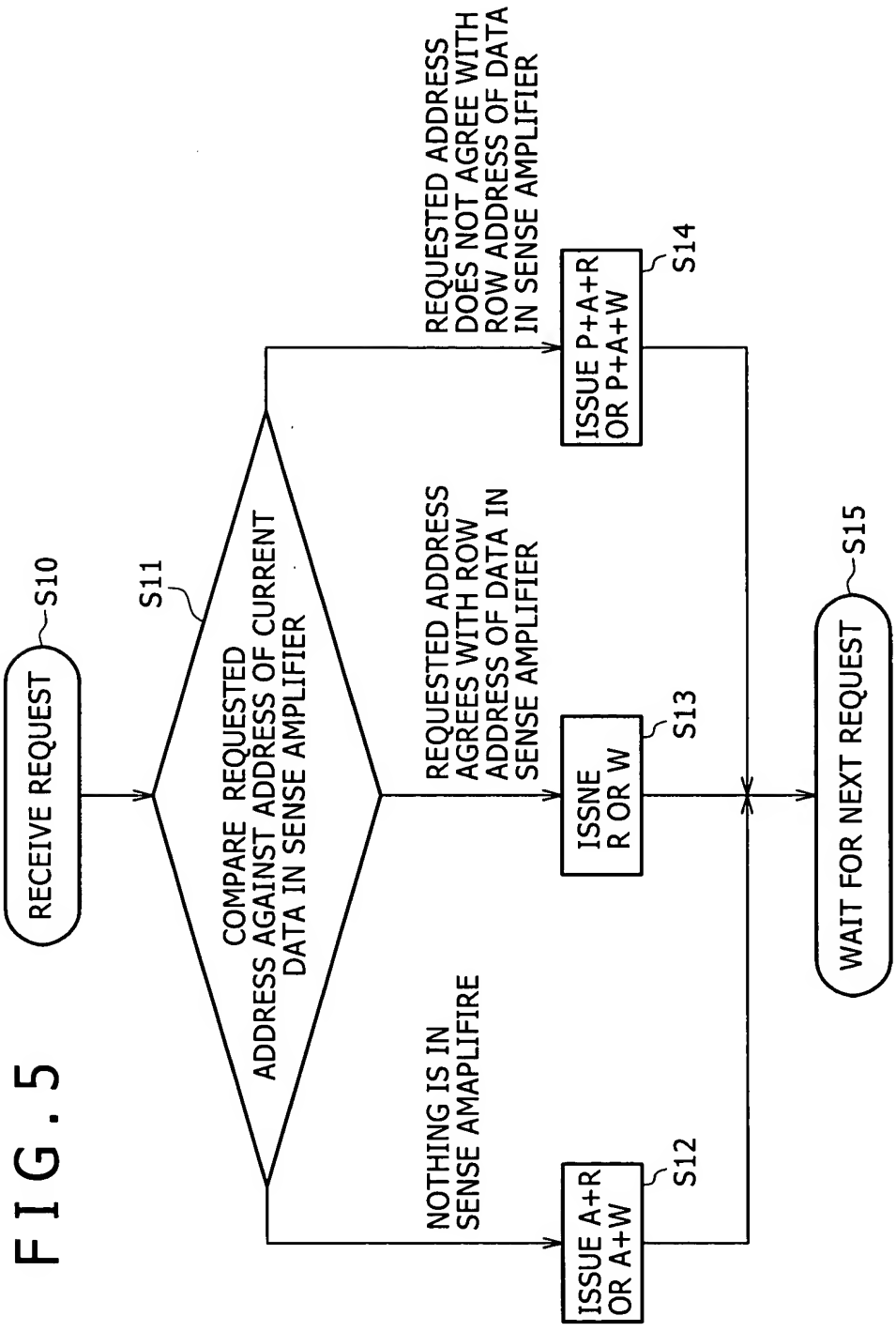

RECEIVE REQUEST
S10
S11
COMPARE REQUESTED ADDRESS AGAINST ADDRESS OF CURRENT DATA IN SENSE AMPLIFIER
REQUESTED ADDRESS AGREES WITH ROW ADDRESS OF DATA IN SENSE AMPLIFIER
ISSNE R OR W
S13
REQUESTED ADDRESS DOES NOT AGREE WITH ROW ADDRESS OF DATA IN SENSE AMPLIFIER
ISSUE P+A+R OR P+A+W
S14
NOTHING IS IN SENSE AMAPLIFIRE
ISSUE A+R OR A+W
S12
WAIT FOR NEXT REQUEST
S15

FIG. 6

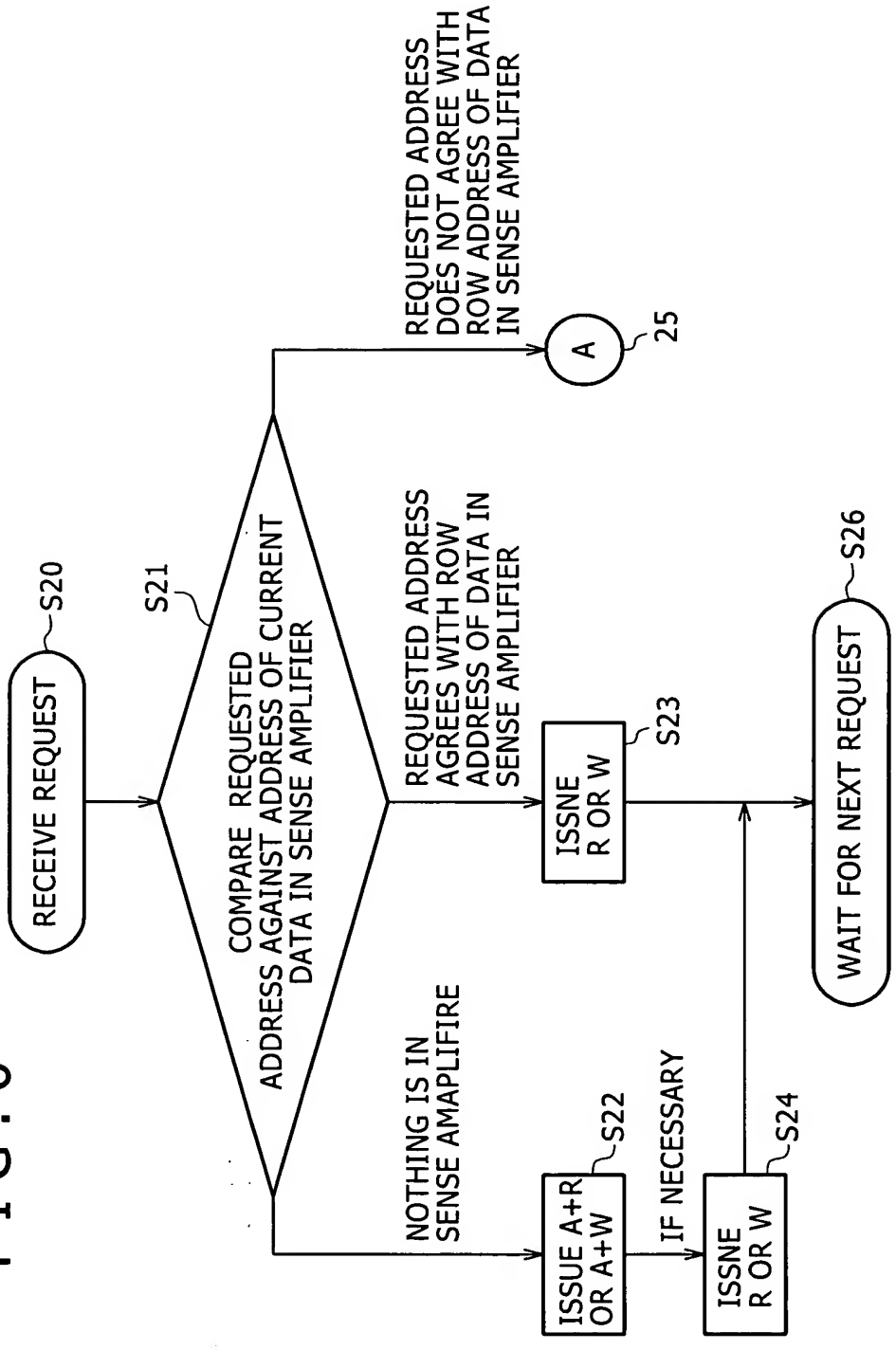

RECEIVE REQUEST
S20
S21
COMPARE REQUESTED ADDRESS AGAINST ADDRESS OF CURRENT DATA IN SENSE AMPLIFIER
REQUESTED ADDRESS DOES NOT AGREE WITH ROW ADDRESS OF DATA IN SENSE AMPLIFIER
A
25
REQUESTED ADDRESS AGREES WITH ROW ADDRESS OF DATA IN SENSE AMPLIFIER
ISSNE R OR W
S23
NOTHING IS IN SENSE AMAPLIFIRE
ISSUE A+R OR A+W
S22
IF NECESSARY
ISSNE R OR W
S24
WAIT FOR NEXT REQUEST
S26

FIG. 7

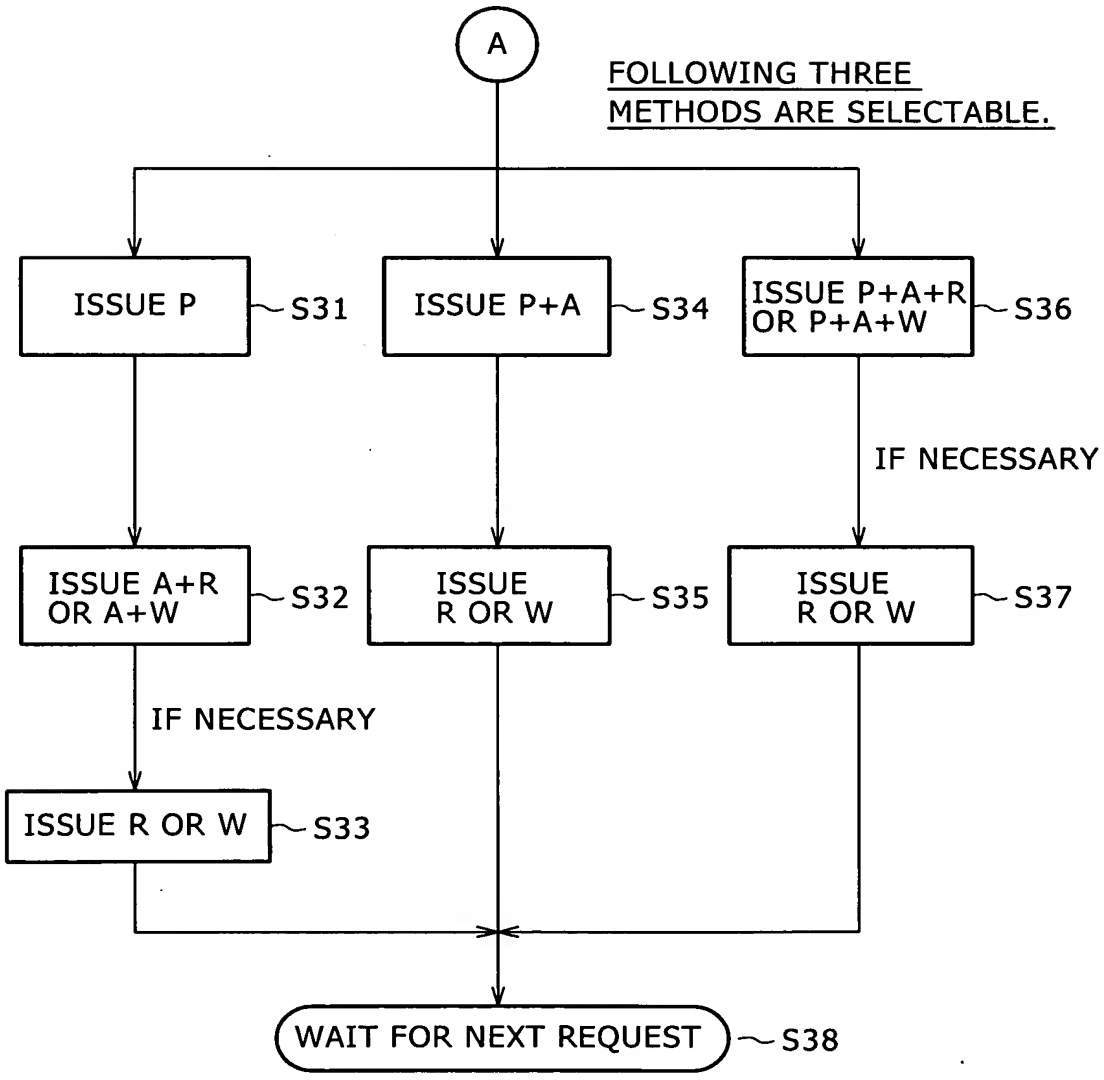
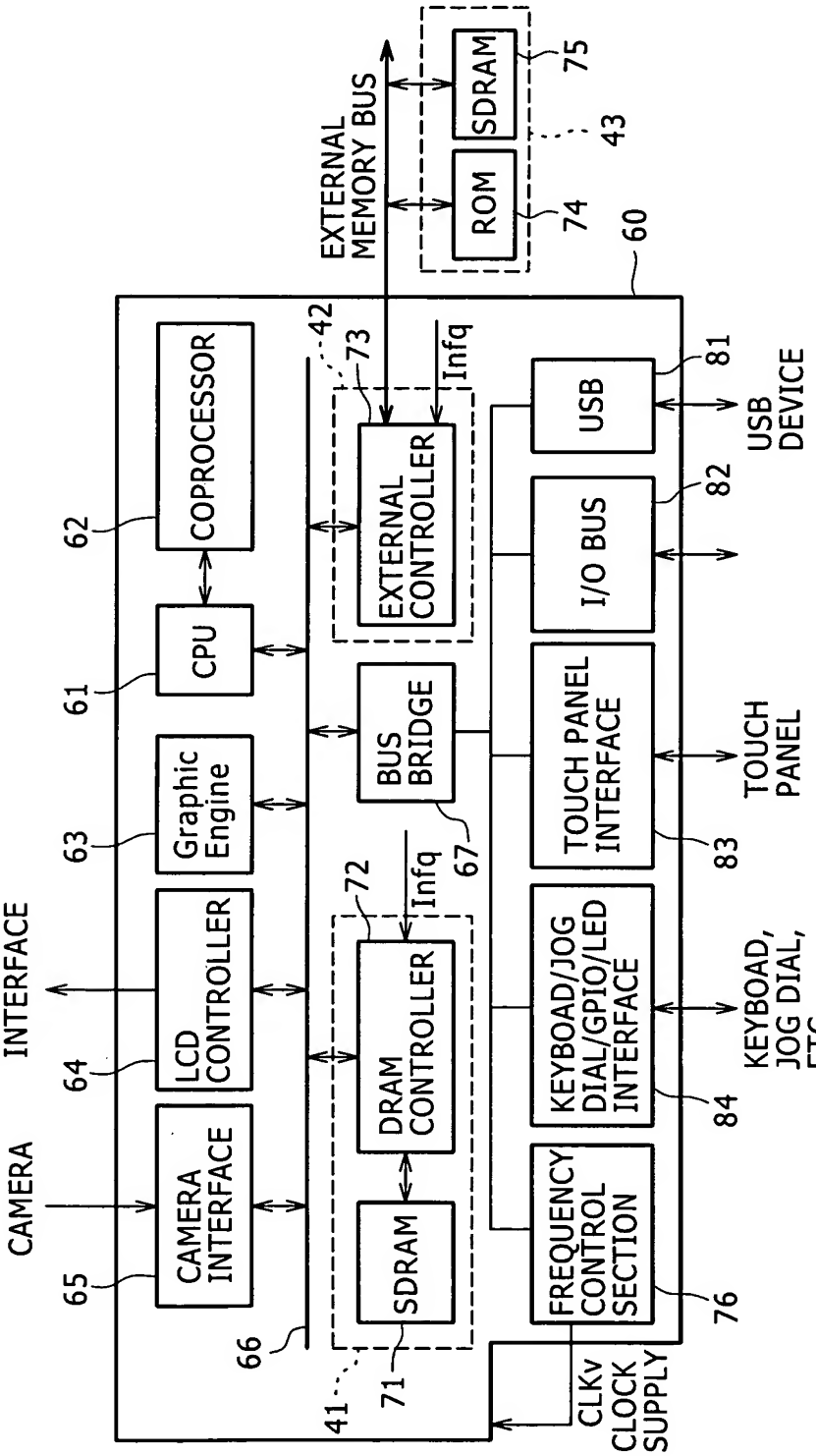

A
FOLLOWING THREE METHODS ARE SELECTABLE.
ISSUE P
S31
ISSUE P+A
S34
ISSUE P+A+R OR P+A+W
S36
IF NECESSARY
ISSUE A+R OR A+W
S32
ISSUE R OR W
S35
ISSUE R OR W
S37
IF NECESSARY
ISSUE R OR W
S33
WAIT FOR NEXT REQUEST
S38

FIG. 8


EXTERNAL MEMORY BUS
SDRAM
ROM
75
74
43
60
42
73
Infq
EXTERNAL CONTROLLER
COPROCESSOR
CPU
62
61
Graphic Engine
63
BUS BRIDGE
67
72
Infq
DRAM CONTROLLER
SDRAM
71
41
66
LCD INTERFACE
LCD CONTROLLER
64
CAMERA
CAMERA INTERFACE
65
USB
81
USB DEVICE
I/O BUS
82
TOUCH PANEL INTERFACE
83
TOUCH PANEL
KEYBOAD/JOG DIAL/GPIO/LED INTERFACE
84
KEYBOAD, JOG DIAL, ETC.
FREQUENCY CONTROL SECTION
76
CLKv
CLOCK SUPPLY